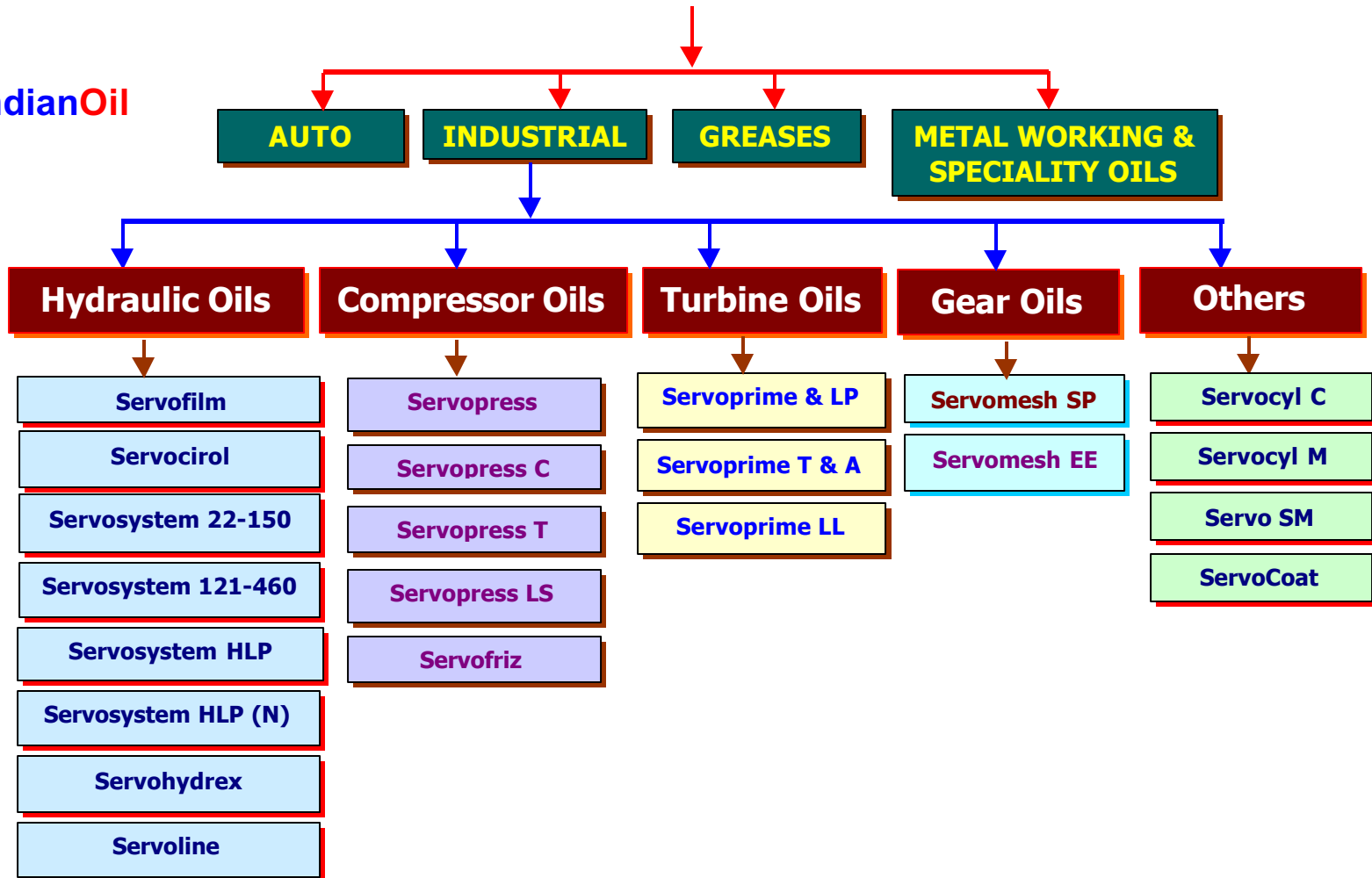


# **SERVO**® PRODUCT DATA SHEET

IndianOil



# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOFILM

IndianOil

### GRADES AVAILABLE - SERVOFILM 32/46/68/100/121\*/150/176\*/220/257\*/320/460

#### DESCRIPTION

Servofilm oils are highly refined straight mineral oils having excellent water separation characteristics.

These are blend cuts from solvent refined high viscosity index base stocks having inherent oxidation and thermal stability.

#### PERFORMANCE BENEFITS

Servofilm oils

- Have good resistance to formation of deposits and sludge at normal operating temperatures
- Rapidly separate from water

#### APPLICATION

Servofilm oils suitable for use in oil film bearings in steel mills. These oils are also recommended for use in circulation systems where non-additive type lubricants with high demulsibility characteristics are required.

#### PERFORMANCE STANDARDS

Servofilm oils meet the following specification:

- IPSS 1-09-001-81
- Morgan Construction Co. USA

Servofilm 46 and 257 meet the following specification:

- IS: 6552 – 1972 Grade 1 and 2 respectively with minor deviation in pour point requirements

### CHARACTERISTICS

ISO VG	32	46	68	81	100	121*	150	176*	220	257*	320	460
Kin. Vis. cSt @ 40°C	29– 33	43 – 48	64 – 72	78 – 86	95 – 105	118 – 124	145 – 155	165– 176	210– 230	255- 265	300 – 340	440 - 480
Viscosity Index, Min	95	95	95	90	90	90	90	90	90	90	90	90
Flash Point (COC), °C Min	190	190	204	204	216	220	230	230	230	232	236	238
Pour Point, °C Max.	0	0	0	0	0	0	0	0	0	0	0	0

\* NON ISO VG Grade

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

For further information please contact our nearest office OR:

Technical Services Dept., Indian Oil Corporation Ltd., G-9, Ali Yavar Jung Marg, Bandra (East), Mumbai – 400 051

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOSYSTEM 22 - 150

IndianOil

### GRADES AVAILABLE - SERVOSYSTEM 22/32/46/57\*/68/81\*/100/150

#### DESCRIPTION

Servosystem oils are anti-wear hydraulic and circulation oils specially formulated for efficient lubrication of a wide variety of industrial equipment. Servosystem oils are blended from highly refined base stocks and carefully selected antioxidant, anti-wear, anti-rust and anti-foam additives.

#### PERFORMANCE BENEFITS

Servosystem oils

- Provide good wear- protection, thereby prolonging service life of moving parts
- Possess high film strength properties which help minimise friction and wear
- Provide rust-protection, to reduce the incidence of corrosion
- Have excellent resistance to oxidation thereby giving long service life
- Have reduced tendency to foam thereby minimise the chance of noisy operation and erratic actuator response

#### APPLICATION

Servosystem oils are recommended as fluid media for hydraulic systems and hydraulic pumps even under severe operating conditions in stationary and mobile equipment. These oils are also recommended for circulation, splash, bath and ring oiling systems of the bearings (both plain and anti-friction) and gears of industrial machinery that require a long life lubricant. These oils can be used for chain drives and compressor crankcase lubrication.

They are not suitable for lubrication of turbines and silver or silver coated components in any equipment.

#### PERFORMANCE STANDARDS

- IS: 10522:1983 ( Reaffirmed 1993 )

#### MANUFACTURERS APPROVAL

- Bharat Pumps & Compressors Ltd., Naini
- Hindustan Machine Tools Ltd., Bangalore
- Kirloskar Bros. Ltd., Pune
- Heavy Engg. Corporation, Ranchi
- Revathi CP Equipments

### CHARACTERISTICS

GRADE	22	32	46	57*	68	81*	100	150
Kinematic Viscosity, cSt @ 40°C	20-24	29-33	43-48	55-60	64-72	78 - 85	95-105	145-155
Viscosity Index, Min	95	95	95	95	95	95	90	90
Flash Point (COC), °C Min.	160	190	200	210	210	210	210	230
Pour Point, °C Max.	(-) 6	(-) 6	(-) 6	(-) 6	(-) 6	(-) 6	(-) 6	(-) 6
Rust Test, (D-665 A&B, 24 hrs.)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

\* NON ISO VG

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOSYSTEM 121 - 460

IndianOil

### GRADES AVAILABLE - SERVOSYSTEM 121/176/220/320/460

#### DESCRIPTION

Servosystem oils are high quality circulation oils designed for use in a wide variety of industrial equipment. These oils are incorporated with specially selected sludge dispersant, which prevents the deposition of harmful oil-insoluble sludge and varnish in circulating systems, even on extended service.

#### APPLICATION

These oils are particularly suitable for lubrication of anti-friction particularly of paper mill dryer rolls, plastic film calendars and paper corrugators where the excellent resistance of these oils, to the formation of harmful deposits, results into outstanding benefits. These oils find wide usage as gear and bearing lubricants in coal pulverizers and a variety of other ore and rock crushing machinery. These oils are also extensively used for long, trouble free operation of compressors, machine tools, hydraulic systems, circulating oil systems and small enclosed gears where EP lubricants are not necessary.

#### PERFORMANCE BENEFITS

- Provide long term protection against rust and corrosion
- Have resistance to the formation of sludge and deposits in the system
- Provide long life to moving parts due to adequate anti-wear properties
- Have reduced foaming tendency
- Ensure longer intervals between oil changes and
- Ensure longer intervals between oil changes and system clean ups

#### MANUFACTURERS APPROVAL

Servosystem oils are approved by the leading machinery manufactures, such as:

- S.L.M. Maneklal Industries Ltd., Ahmedabad
- Tat Robins-Fraser Ltd., Jamshedpur

### CHARACTERISTICS

ISO VG	121*	176*	220	320	460
Kinematic Viscosity, cSt @ 40°C	118-124	170-180	210-230	315-350	440-500
Viscosity Index, Min.	90	90	90	90	90
Flash Point (COC), °C Min	220	230	230	230	260
Pour Point, °C Max	(-) 3	(-) 3	(-) 3	(-) 3	(-) 3
Rust Test, (D-665 A&B, 24 hrs)	Pass	Pass	Pass	Pass	Pass

\* Non ISO VG

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOSYSTEM HLP

IndianOil

GRADES AVAILABLE – SERVOSYSTEM HLP 22, 32, 46, 68, 100, 150

### DESCRIPTION

Servosystem HLP oils are high performance hydraulic oils. These oils provide superior antiwear protection, excellent oxidation and thermal stability, outstanding hydraulic stability and good demulsibility. Servosystem HLP oils also possess superior filterability characteristics. These oils provide problem free service and have been found to be far superior in performance compared to other commercially available anti-wear, heavy duty hydraulic oils.

### APPLICATION

Servosystem HLP oils are recommended as a fluid media in hydraulic systems, operating under extremely severe conditions. These oils are recommended for sophisticated high performance electro-hydraulic or numerically controlled systems. Servosystem HLP oils are also recommended for lubrication of screw compressors requiring oil of excellent thermal stability and low CCR value. These oils are not suitable where the components are of silver or silver coated.

### PERFORMANCE BENEFITS

Servosystem HLP oils

- # ensure long service life due to outstanding oxidation and thermal stability.
- # provide sludge free high temperature performance.
- # provide excellent filterability characteristics.
- # readily separate from water because of excellent demulsibility characteristics.
- # provide superior long term protection against rust and corrosion.
- # Ensure overall problem free performance.

### PERFORMANCE STANDARDS

Servosystem HLP oils are formulated to meet the following specifications :

- # DIN 51524 Part 2
  - # DENISON HF-O
  - # US STEEL 127
  - # IS : 11656-1986 (Reaffirmed 1991)
  - # IS:10522-1983(Reaffirmed 1993)
  - # ATLAS COPCO R8 & R9, HOESCH HLP
- Servosystem HLP oils are recommended by the leading equipment manufacturers such as :
- # Atlas Copco (India) Ltd.

### CHARACTERISTICS

ISO VG GRADE	22	32	46	68	100	150
Kinematic Viscosity @ 40°C, cSt	20-24	29-33	43-48	64-72	95-105	145 – 155
Viscosity Index, Min	100	100	98	95	95	90
Flash Point(COC), °C, Min	160	200	200	210	210	230
Pour Point, °C, Max	(-)21	(-)21	(-)15	(-)12	(-)12	(-)6
Emulsion Test D-1401, 40-37-3, Minutes, Max	20	20	20	25	25	30
FZG, Rating Stage, Failure	-	10	10	10	10	11

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOSYSTEM HLP(N)

IndianOil

GRADES AVAILABLE – SERVOSYSTEM HLP (N) 22, 32, 46, 68, 100, 150

### DESCRIPTION

Servosystem HLP(N) oils are high performance hydraulic oils. These oils provide superior antiwear protection, excellent oxidation and thermal stability, outstanding hydraulic stability and good demulsibility. Servosystem HLP (N) oils also possess superior filterability characteristics. These oils provide problem free service and have been found to be far superior in performance compared to other commercially available anti-wear, heavy duty hydraulic oils.

### APPLICATION

Servosystem HLP (N) oils are recommended as a fluid media in hydraulic systems, operating under extremely severe conditions. These oils are recommended for sophisticated high performance electro-hydraulic or numerically controlled systems. Servosystem HLP (N) oils are also recommended for lubrication of screw compressors requiring oil of excellent thermal stability and low CCR value. These oils are not suitable where the components are of silver or silver coated.

### PERFORMANCE BENEFITS

Servosystem HLP (N) oils

- # ensure long service life due to outstanding oxidation and thermal stability.
- # provide sludge free high temperature performance.
- # provide excellent filterability characteristics.
- # readily separate from water because of excellent demulsibility characteristics.
- # provide superior long term protection against rust and corrosion.
- # Ensure overall problem free performance.

### PERFORMANCE STANDARDS

Servosystem HLP (N) oils are formulated to meet the following specifications :

- # DIN 51524 Part 2
- # DENISON HF-O
- # US STEEL 127
- # IS : 11655-1986(Reaffirmed 1991)
- # IS:10522-1983 (Reaffirmed 1993)

Servosystem HLP(N) oils are recommended by the leading equipment manufacturers such as :

- # Atlas Copco (India) Ltd.

### CHARACTERISTICS

ISO VG	22	32	46	68	100	150
Kinematic Viscosity @ 40°C, cSt	20-24	29-33	43-48	64-72	95-105	145 – 155
Viscosity Index, Min	85	95	95	95	95	90
Flash Point(COC), °C, Min	160	200	200	210	210	230
Pour Point, °C, Max	(-)21	(-)21	(-)15	(-)12	(-)12	(-) 18
Emulsion Test D-1401, 40-37-3, Minutes, Max	20	20	20	25	25	30
FZG, Rating Stage, Failure	-	10	10	10	10	10

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOHYDREX

IndianOil

### GRADES AVAILABLE – SERVOHYDREX 32, TH46, 100

#### DESCRIPTION

ServoHydrex oils are anti-wear type hydraulic oils having a very high viscosity index and low pour point. These oils are blended with high quality base stocks and are incorporated with oxidation inhibitor and anti-rust additives to give long trouble free service. The defoamant additive prevents build-up of foam in the hydraulic system. ServoHydrex oils have special anti-wear additive essential for certain hydraulic equipment used for heavy duty operations.

#### APPLICATION

ServoHydrex oils are recommended as fluid media in all hydraulic systems where very low operating temperatures are encountered and the application demands use of a very high viscosity index oils.

#### PERFORMANCE BENEFITS

- Easy flow at very low temperatures
- Suitable for a wide range of operating temperatures due to its very high viscosity index
- Provide good protection against wear thereby prolonging service life of moving parts
- Possess excellent resistance to oxidation
- Have reduced foaming tendency
- Provide protection against rust and corrosion

#### APPROVALS

- ServoHydrex TH 46 is approved by TELCO for Tata Hitachi excavators.
- ServoHydrex 100 is approved by L&T for use in Poclain excavators.

### CHARACTERISTICS

ISO VG	32	TH46	100
Kinematic Viscosity, cSt @ 40°C	29-33	43-48	100-110
Viscosity Index, Min.	160	135	130
Flash Point (COC), °C Min.	140	200	210
Pour Point, °C Max.	(-) 39	(-) 33	(-) 24
Rust Test, (D-665 B, 24 hrs.)	Pass	Pass	Pass

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOLINE

IndianOil

### GRADES AVAILABLE - SERVOLINE 32/46/68/100/150/220/320/460

#### DESCRIPTION

Servoline oils are developed for general lubrication of all types of industrial machinery using once-through lubrication system i.e. all-loss system. These oils contain film strength and anti-rust additives to provide improved performance.

#### PERFORMANCE BENEFITS

Servoline oils

- Provide protection against corrosion and rust, even during idle periods
- Maintain thin film of oil under light and medium loads
- Provide good oiliness for general lubrication of machinery, even under boundary lubrication conditions

#### APPLICATION

Servoline oils are recommended for use in the lubrication systems of machine tools, textile machines and other machine parts, which are lubricated by a thin film of oil. Heavier grades of Servoline series are also used in the lubrication of small open gears, under light duty conditions, where the oil is applied intermittently by means of an oilcan.

#### PERFORMANCE STANDARDS

Servoline oils meet the following specification:  
IS : 493 – 1981Part 1 (Reaffirmed 1993)

Servoline oils are approved by the leading machinery manufacturers, such as:

- ACC Vickers Babcock Ltd., Durgapur
- Texmaco Ltd., Calcutta

### CHARACTERISTICS

ISO VG	32	46	68	100	150	220	320	460
Kin. Viscosity, cSt @ 40°C	29-33	42-50	64-72	95-105	145-155	210-230	300-350	440 - 480
Viscosity Index, Min	90	90	90	90	90	90	90	90
Flash Point (COC), °C Min	150	160	175	175	204	220	230	250
Pour Point, °C Max.	0	0	0	0	0	0	0	0
Rust Test, (D-665A,24 hrs)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOCIROL

IndianOil

### GRADES AVAILABLE - SERVO CIROL 32/46/68/100/150

#### DESCRIPTION

Servocirol oils are rust and oxidation inhibited grades intended for use in situations where long service period is desired and improved anti-wear characteristics are not essential.

#### PERFORMANCE BENEFITS

Servocirol oils

- Readily separate from water since they have good demulsibility
- Provide good protection against rust and corrosion during idle periods, even under humid condition stability
- Help in reducing the number of grades, due to its multi-functional properties

#### APPLICATION

Servocirol oils are recommended for:

- Hydraulic systems where anti-wear properties are not specifically needed
- Enclosed industrial gear boxes where EP lubricants are not required
- Lubrication of plain and anti-friction bearings of turbo-feed pumps, turbo blowers, etc,
- Moderate duty, intermittent operating, turbo sets where the oil is generally changed on yearly basis.

#### PERFORMANCE STANDARDS

- IS : 3098 – 1983 (Reaffirmed 1993).
  - DIN- 51524 for hydraulic oils H and H-L (except very low pour point)
  - US Steel requirement No. 135
- Servocirol 32, 46, 68 and 150 meet Cincinnati Milacron, USA specification P-38, P-55, P-54 and P-57 respectively.

#### MANUFACTURERS' APPROVAL

- Cincinnati Milacron, USA

### CHARACTERISTICS

ISO VG	32	46	68	100	150
Kinematic Viscosity, cSt @ 40°C	29-33	43-48	64-72	95-105	145-155
Viscosity Index, Min	95	95	95	90	90
Flash Point, (COC) °C Min	190	200	210	210	230
Pour Point, °C Max	(-) 6	(-) 6	(-) 6	(-) 6	(-) 6
Rust Test, (D-665 B, 24 hrs)	Pass	Pass	Pass	Pass	Pass

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOPRESS

**IndianOil**

**GRADES AVAILABLE - SERVO PRESS 32, 68, 100, 150, 220, 320**

### DESCRIPTION

Servopress oils are air compressor lubricants specially developed to minimise the incidence of fire and explosions in modern air compressors. These oils provide satisfactory lubrication under prolonged high temperature and load conditions, since they are exceptionally stable and are incorporated with antioxidant and rust inhibitor additives.

### APPLICATION

Servopress oils are suitable, not only for cylinder lubrication of high performance, portable and stationary reciprocating units, but also for rotary compressors. Servopress oils are recommended for air compressor lubrication with air discharge temperature upto 220°C

### PERFORMANCE BENEFITS

- Provide excellent resistance to oxidation, thus permitting extended oil drain intervals
- Minimise carbon deposits on the valve plates thereby reducing risk of fire and explosion
- Enable trouble free starting at low temperatures
- Provide effective protection against rust and corrosion during routine shut down
- Reduce oil consumption.
- Reduce maintenance cost, due to minimum carbonisation, resulting in optimum valve service life and longer overhaul intervals

### PERFORMANCE STANDARDS

Servopress oils meet the following specifications:

- ISO DIS – 6521
- DIN – 51506, VD-L

### MANUFACTURERS APPROVAL

Servopress oils are approved by:

- Atlas Copco (India) Ltd., Pune
- K. G. Khosla Compressors (Pvt.) Ltd., Faridabad.

### CHARACTERISTICS

ISO VG	32	46	68	100	150	220	320
Kinematic Viscosity, cSt @ 40°C	29-33	43-48	64-72	95-105	145-155	210 – 230	305 – 335
Viscosity Index, Min,	95	95	95	95	95	90	90
Flash Point (COC), °C Min	190	200	204	210	220	230	250
Pour Point, °C Max	(-) 9	(-) 9	(-) 9	(-) 9	(-) 3	(-) 3	(-) 3
Rust Test, (D-665 A&B, 24 hrs.)	Pass	Pass	Pass	Pass	Pass	Pass	Pass

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOPRESS C

IndianOil

### GRADES AVAILABLE - SERVO PRESS C 100, C 220

#### DESCRIPTION

Servopress C oils are high quality, compounded mineral lubricants that have been specially developed for use in multistage air and gas compressors handling moist air/gas.

They have excellent resistance to the washing action of water and maintain a strong oil film on compressor cylinder surfaces. Further more, any carbon formed under high temperature condition is soft and fluffy nature having minimum tendency to adhere to discharge valve and other metal surfaces.

#### APPLICATION

Servopress C oils are recommended for cylinder lubrication of single/multistage air compressors handling moist air. These oils are however, generally not recommended for crankcase lubrication.

Servopress C oil form stable emulsion with water and hence provide excellent lubrication to cylinder liners, piston rings, valves etc., while compressing moist air/gas. The use of Servopress C oils enable easy maintenance and provide long service life to equipment.

#### PERFORMANCE BENEFITS

Servopress C oils

- Provide protection against rust and corrosion
- Reduce carbon forming tendency
- Resist Water Washing action, since they maintain strong oil film on metal surface
- Ensure fluidity even at low temperatures
- Minimise oil consumption

#### PERFORMANCE STANDARDS

Servopress C oils are approved by the leading machinery manufacturers, such as:

- Bharat Pumps and Compressors Ltd., Naini

### CHARACTERISTICS

ISO VG	100	220
Kinematic Viscosity, cSt @ 40°C	95-105	230-240
Flash Point, °C Min.	192	222
Pour Point, °C Max	(-) 9	(-) 9
Rust Test, (D-665 A, 24hrs.)	Pass	Pass

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOPRESS T

IndianOil

### GRADES AVAILABLE - SERVO PRESS T32, T46, T57, T68

#### DESCRIPTION

Servopress oils are new series of compressor lubricants specially formulated for use in rotary vane, centrifugal and screw compressors handling ammonia. These oils are based on high quality turbine base stocks and carefully selected antioxidant and rust inhibitors, which are fully compatible with ammonia. They have minimum sludge forming tendency and do not turn red while in contact with ammonia.

#### APPLICATION

Servopress T oils are suitable for turbine driven centrifugal compressors having common circulation system for bearings, couplings and seal oil system handling ammonia. They can also be used for Screw and Vane Compressors in view of their excellent oxidation stability.

#### PERFORMANCE BENEFITS

- Have excellent resistance to oxidation, and sludge formation, which lead to extended oil drain intervals.
- Provide effective protection against rust and corrosion.
- Do not react with ammonia
- Do not turn red while in contact with ammonia.
- Readily separate from water

#### MANUFACTURERS APPROVAL

Servopress T oils are approved by:

- Bharat Heavy Electricals Ltd., Hyderabad
- Consolidated Pneumatic Tool Co (I) Ltd., Mumbai

### CHARACTERISTICS

ISO VG	32	46	57*	68
Kinematic Viscosity, cSt @ 40°C	29-33	43-48	55 - 60	64 – 72
Viscosity Index, Min,	100	98	95	95
Flash Point (COC), °C Min	200	200	204	215
Pour Point, °C Max	(-)6	(-) 6	(-) 6	(-) 6
Rust Test, (D-665 A&B, 24 hrs.)	Pass	Pass	Pass	Pass
Emulsion Test (ASTM D 1401), 40-37-3, Minutes, Max	15	15	20	20

\* Non ISO VG

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOPRESS LS

IndianOil

### GRADES AVAILABLE - SERVO PRESS LS 320, LS 460

#### DESCRIPTION

Servopress LS oils are specially developed for cylinder lubrication of high pressure syn-gas reciprocating compressors used in fertiliser plants. This oil is blended from carefully selected base stocks having low sulphur content.

Synthetic gas contains Nitrogen and Hydrogen in the ratio of 1: 3 The syn-gas is passed over catalyst beds in convertor where temperature prevails in the range of 550-570°C. Usage of Servopress LS oil, due to its inherent low sulphur, ensures a longer life of the catalyst.

#### PERFORMANCE BENEFITS

Servopress LS oil

- Ensures long life of catalyst, used in convertor
- Minimises wear of cylinder liner and rings

#### APPLICATION

Servopress LS oil is recommended for cylinder lubrication of syn-gas compressor in methanol plants and ammonia plants in fertiliser manufacturing units. The compressors are generally slow speed, multi-stage, high capacity type and operate at high temperatures (130-150°C).

Servopress LS oil is not intended for use as a crankcase lubricant.

### CHARACTERISTICS

ISO VG	320	460
Kinematic Viscosity, cSt @ 40°C	295 - 305	415 - 470
Viscosity Index, Mix.	85	90
Flash Point (COC), °C Min	226	260
Pour Point, °C Max.	(-) 3	(-) 3

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

For further information please contact our nearest office OR:

Technical Services Dept., Indian Oil Corporation Ltd., G-9, Ali Yavar Jung Marg, Bandra (East), Mumbai – 400 051

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOFRIZ

IndianOil

GRADES AVAILABLE - SERVO FRIZ 12, 22, 32, 46, 68, 100

### DESCRIPTION

Servofriz oils are high quality mineral lubricants formulated for the lubrication of reciprocating and rotary refrigeration compressors.

These oils possess inherent resistance to oxidation and deposit formation.

### PERFORMANCE BENEFITS

- Possess high fluidity at very low temperatures
- Resist deposit formation thereby keeping compressor parts clean
- Reduce compressor valve maintenance due to less deposits
- Ensure high condenser efficiency
- Have long service life due to high oxidation and thermal stability
- Have reduced tendency to foam
- Minimise copper plating due to their resistance to interact with metals in the system

### APPLICATION

Servofriz oils are recommended for the lubrication of a wide range of refrigeration compressors. These oils can be used with conventional refrigerants, except sulphur di-oxide, in both reciprocating and rotary compressors.

They are also suitable for use in properly designed and well maintained refrigeration systems, where evaporator temperatures are lower than the pour point of the oil.

### PERFORMANCE STANDARDS

Servofriz oils meet the following specification:

- IS : 4578-1989
- Servofriz 68 meets Carrier Corporation, USA specification No. PP 46-1

### MANUFACTURERS APPROVAL

Servofriz oils are approved by the leading refrigeration compressor manufactures, such as:

- Bharat Heavy Electricals Ltd., Hyderabad
- Bharat Pumps and Compressors Ltd., Naini
- Frick India Ltd., Faridabad

### CHARACTERISTICS

ISO VG	12*	22	32	46	68	100
Kinematic Viscosity, cSt @ 40 °C	12-14	20-24	33-35	43-46	63-65	90 - 100
Flash Point (COC), °C Min.	140	150	154	160	170	200
Pour Point, °C Max.	(-) 39	(-) 45	(-) 30	(-) 27	(-) 24	(-) 24

\* Non ISO VG

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOPRIME & LP

IndianOil

### GRADES AVAILABLE - SERVO PRIME 32/46/68/100/ 32LP/46LP/68LP

#### DESCRIPTION

Servoprime oils premium quality lubricants especially formulated to give outstanding performance and long life in modern steam, gas and hydraulic turbines. Servoprime oils are manufactured from selectively refined distilled base stocks and contain carefully chosen antioxidant, rust inhibitor and defoamant additives. Servoprime LP oils are special purpose low pour turbine oils.

These oils have been tested for radiation stability and found suitable for use in turbines exposed to radiation encountered in nuclear power plants.

#### PERFORMANCE BENEFITS

- Provide excellent long term protection against rust and corrosion
- Readily separate from water
- Ensure long service life since they possess outstanding oxidation stability
- Reduced tendency to foam
- Able to release entrained air at a rapid rate

#### APPLICATION

Servoprime oils are recommended for use in the lubrication system of steam, gas and hydraulic turbines operating under all service conditions. In addition, Servoprime oils give outstanding performance in hydraulic systems, circulating lubrication systems, enclosed bearings and other industrial machines in which long trouble free service of lubricant is required. Servoprime LP oils are meant for low temperature applications such as Rotoflow expanders and Turbo-compressors used in refrigeration applications.

#### PERFORMANCE STANDARDS

Servoprime oils meet the following specification:

- Turbine oil requirements of BHEL
- BS 489/1983
- GE, USA specification GEK-27070
- IS: 1012 1987-1987 (Reaffirmed)

#### MANUFACTURERS' APPROVAL

- Bharat Heavy Electricals Ltd., Bhopal
- Bharat Heavy Electricals Ltd., Hardwar

### CHARACTERISTICS

ISO VG	32	46	57*	68	100	32LP	46LP	68LP
Kinematic Viscosity, cSt @ 40°C	29-33	43-48	55-60	64-72	95-105	29-33	43-48	64-72
Viscosity Index, Min.	100	98	95	95	95	100	98	95
Flash Point, (COC), °C Min.	200	200	210	210	220	200	200	210
Pour Point, °C Max.	(-) 6	(-) 6	(-) 6	(-) 6	(-) 6	(-) 30	(-) 30	(-) 30
Neutralisation No. mg KOH/gm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Rust Test, (D-665 A&B, 24 hrs.)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

\* Non ISO VG

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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**SERVOPRIME T & A****IndianOil****GRADES AVAILABLE – SERVOPRIME 32T, 46T, 57T\*, 68T, 32A****DESCRIPTION**

Servoprime T oils have been specially formulated to satisfy the demanding requirements of modern high-output steam turbines including their gear units. Servoprime T oils show exceptionally good oxidation stability, excellent demulsibility and prevent foaming tendency. These also possess good air release property. These properties are retained during prolonged service life and helps in giving outstanding performance and trouble free service.

Servoprime 32 A provides extra antiwear and oxidation protection. This increases life of the load gears and prevents deposits induced troubles in critical turbine systems.

**PERFORMANCE BENEFITS**

- # Outstanding oxidation and thermal stability that ensure long trouble free service life.
- # Provide excellent antiwear protection.
- # Give excellent long term protection against rust and corrosion.
- # Prevent foaming tendency.
- # Release entrained air quickly.
- # Readily separates out water.

**APPLICATION**

Servoprime T oils are recommended for use in the lubrication system of steam, gas and water turbines operating under all service conditions. In addition, Servoprime T oils provide outstanding performance in hydraulic systems, circulation systems, enclosed bearings and other industrial machines in which long trouble free service of lubricant is required.

Servoprime 32 A has been specially developed for GEC Alsthom Turbines.

**PERFORMANCE STANDARDS**

Servoprime T oils exceed the following specifications :

- # Brown Boveri HTGD 90117
- # GEK 28143A
- # SIEMENS (TLU 901304)

Servoprime 32 A is approved by the leading Gas Turbine manufacturers:

- \* GEC Alsthom, France

**CHARACTERISTICS**

ISO V	32T	46T	57T *	68T	32A
Kinematic Viscosity, cSt @ 40°C	29-33	43-48	55-60	64-72	29-33
Viscosity Index, Min.	100	98	95	95	100
Flash Point, (COC), °C Min.	200	200	210	210	200
Pour Point, °C Max.	(-) 6	(-) 6	(-) 6	(-) 6	(-) 6
Neutralisation No. mg KOH/gm	0.2	0.2	0.2	0.2	0.2
Rust Test, (D-665 B, 24 hrs.)	Pass	Pass	Pass	Pass	Pass
FZG Rating Failure Stage	8	8	8	8	10

**HEALTH & SAFETY**

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOPRIME LL

IndianOil

GRADES AVAILABLE – SERVOPRIME 32 LL, 46 LL, 68 LL,

### DESCRIPTION

Servoprime LL oils are premium quality turbine oils especially formulated for long life in modern turbines. Servoprime LL oils are manufactured from selectively refined base stocks and contain carefully chosen antioxidant, rust inhibitor and defoamant additives.

### APPLICATION

Servoprime LL oils are recommended for use in lubrication system of modern steam, gas and hydraulic turbines operating under all service conditions.

### PERFORMANCE BENEFITS

- Higher oxidation stability reserve, almost two times.
- Superior antiwear and extreme pressure characteristic.
- Exceeds the requirement of all national and international specifications.
- Is a potential oil for providing problem free long life for high severity turbines of modern power plants.

### PERFORMANCE STANDARDS

- IS:1012-1987 (Reaffirmed 1993)
- BS:489-1993

### MANUFACTURERS APPROVAL

- BHEL, Haridwar

### CHARACTERISTICS

ISO VG	32	46	68
Kinematic Viscosity @ 40°C	29 – 35	42 – 50	64 – 72
Viscosity Index, Min	100	98	95
Pour Point, °C, Max	(-) 6	(-) 6	(-) 6
Flash Point, °C, Min	200	200	210
Rust Test, D-665B, 24 hrs.	Pass	Pass	Pass
Emulsion Test @ 54°C D-1401, Minutes,	20	20	20

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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## SERVOMESH SP

**IndianOil**

### GRADES AVAILABLE - SERVO MESH SP 68/100/150/220/257/320/460/680/1000

#### DESCRIPTION

Servomesh SP oils are extreme pressure type industrial gear lubricants. These oils demonstrate improved thermal stability and oxidation resistance over conventional lead-naphthenate oils. They have good demulsibility characteristics, low foaming tendency and provide rust and corrosion protection to metal surfaces.

#### PERFORMANCE BENEFITS

- Have reduced tendency to foam
- Provide high load carrying ability
- Ensure excellent wear protection
- Ensure long service life since they have good oxidation and thermal stability
- Minimise the formation of sludge and deposits, even at high bulk oil temperatures
- Ensure ready separation from water due to good demulsibility property
- Protect metals against rust and corrosion

#### APPLICATION

Servomesh SP oils are recommended for all types of enclosed gear drives with circulation or splash lubrication systems. Servomesh SP oils are particularly recommended for gear sets working under heavy or shock load conditions. These oils can be used in systems involving gears, plain bearings, roller bearings and sliding surfaces. They are also suitable for chain drives, sprockets, flexible couplings, plain and rolling element bearings employing splash, circulation and spray lubrication systems.

#### PERFORMANCE STANDARDS

- AGMA standard 250.04
  - ASLE standard G-315, G-1000, G-1500 and G-2150
  - IS: 8406 – 1993
  - US Steel requirement No. 222 and 224
- Servomesh SP 68, 100, 150, 220, 320 and 460 meet Cincinnati Milacron, USA specification No. P-63, P-76, P-77, P-74, P-59 & P-35 respectively.

#### MANUFACTURERS' APPROVAL

- Servomesh SP oils are approved by
- Cincinnati Milacron, USA
  - David Brown Gear Industries Ltd., UK

### CHARACTERISTICS

ISO VG	68	100	150	220	257*	320	460	680	1000
Kin. Vis. cst @ 40°C	64 - 72	95 - 105	145 - 155	210 - 230	250 - 280	320 - 350	420 - 500	615 - 660	980 - 1050
Viscosity Index, Min.	90	90	90	90	90	90	90	90	80
Flash Point (COC), °C Min	204	204	204	232	232	232	232	232	280
Pour Point, °C Max.	(-) 6	(-) 6	(-) 6	(-) 3	(-) 3	(-) 3	(-) 3	(-) 3	(+) 6
FZG Rating, 12th Stage	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

\* NON ISO VG

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVOMESH EE

**IndianOil**

**GRADES AVAILABLE – SERVOMESH EE 220, 257\*, 320, 460, 680**

**DESCRIPTION**

Servomesh EE oils are Energy Efficient industrial gear oils, represent a new and significant advancement in gear lubricant technology. It satisfies the new era’s demands – “Energy Savings” and “Resource Conservation” through reduction in frictional losses, extension of gear life and prevention of irregular wear. The superior performance of these oils has been proven in field conditions especially in heavily loaded industrial gear systems. The oils demonstrate improved thermal stability and oxidation resistance over the conventional Sulphur-Phosphorus (S-P) gear oils. These oils possess good demulsibility, low foaming tendency and provide excellent rust and corrosion protection to metal surfaces.

**APPLICATION**

Servomesh EE gear oils provide significant energy savings in industrial gear systems when compared to conventional S-P gear oils. Servomesh EE gear oils meet the most stringent requirements of the modern gear lubricant. These oils are recommended for all types of enclosed gear drives, heavily loaded bearings and industrial gears running at high speeds, high pressures and under impact loads with circulation or splash lubrication systems.

**PERFORMANCE BENEFITS**

- Improve gear efficiency.
- Have outstanding load carrying ability.
- Reduce power consumption and provide energy savings.
- Lower bulk oil temperature.
- Provide smooth running through reduced vibration and noise.
- Minimise formation of sludge and deposits even at high temperatures.
- Protect components against rust and corrosion.

**PERFORMANCE STANDARDS**

Servomesh EE gear oils meet the following specifications:

- US STEEL 224
- DIN 51517 PART 3
- DRAVID BROWN SL:53.101
- FORD MOTOR CO. M-2C 142C
- CINCINNATI MILACRON P-59
- IPSS-1-09-003
- AGMA 250.04
- IS: 8406 : 1993

**CHARACTERISTICS**

ISO VG	220	257*	320	460	680
Kinematic Viscosity @ 40°C, cSt	210-230	250-280	320 – 350	420 - 500	615 – 660
Viscosity Index, Min.	90	90	90	90	90
Flash Point (COC), °C, Min.	230	230	232	232	232
Pour Point, °C, Max	(-) 3	(-) 3	(-) 3	(-) 3	(-) 3
Rust test (D-665 B)	Pass	Pass	Pass	Pass	Pass
FZG, Rating Stage, Pass	12	12	12	12	12

\* Non ISO VG

**HEALTH & SAFETY**

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOCYL C

IndianOil

### GRADES AVAILABLE - SERVOCYL C 460/530/680/800

#### DESCRIPTION

Servocyl C oils are highly refined steam cylinder lubricating oils, compounded with specially selected materials, which can withstand high temperatures, These oils have excellent oiliness, good film strength characteristics and resist water wash out.

#### PERFORMANCE BENEFITS

Servocyl C oils

- Enable higher loading of equipment, due to its high-load carrying ability
- Reduce wear of cylinder walls and piston rings
- Provide Protection against rust and corrosion
- Resist scouring action of steam
- Minimise tendency of deposit formation at elevated temperatures
- Resist severe water washing, due to excellent adhesive property

#### APPLICATION

Servocyl C oils are recommended for steam cylinder lubrication under wet saturated steam conditions.

These oils are not suitable for such applications where the steam condensate is re-used by mixing with boiler feed water. These oils are also recommended for lubrication of worm gears. Other major uses include lubrication of paper and textile mill calendar bearings and sugar mill roller bearings.

#### PERFORMANCE STANDARDS

Servocyl C 460 & 800 meet end-use requirements of IS: 1589-1966 Grade 1 Type 2 and Grade 2 Type 2 respectively.

Servocyl C oils are approved by the leading machinery manufacturers, such as:

- Bharat Heavy Electricals Ltd., Trichy
- Bharat Pumps and Compressors Ltd., Naini

### CHARACTERISTICS

ISO VG	460	530 *	680	800
Kinematic Viscosity, cSt @ 40°C	450-500	520-560	640-680	780-820
Viscosity Index, Min.	90	90	85	85
Flash Point (COC), °C Min.	280	280	280	280
Pour Point, °C Max	6	6	6	6
CCR, % wt., Max	2.5	3.5	3.5	3.5

\* Non ISO VG

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOCYL M

IndianOil

### GRADES AVAILABLE - SERVOCYL M 680/1000/1500

#### DESCRIPTION

Servocyl M oils are highly refined steam cylinder lubricants having excellent thermal and chemical stability. These oils provide good resistance to the washing effect of moisture and separate easily from exhaust steam and condensate.

Servocyl M oils are non-additive treated mineral oils, blended from high quality, specially refined, high viscosity index base stocks.

#### APPLICATION

Servocyl M oils are recommended for cylinder lubrication of steam engines handling superheated steam. These oils are specially suitable for services demanding straight mineral oil where –in ready separation of condensate from lubricant is necessary so that the condensate can be further used in certain process work.

These oils are not recommended for wet steam conditions.

#### PERFORMANCE BENEFITS

Servocyl M oils

- Enable higher loading of equipment, since they have high-load carrying ability
- Minimise wear of cylinder wall and piston rings
- Protect engine parts against rusting and corrosion
- Reduce steam consumption, due to excellent sealing characteristics and low frictional losses
- Minimise tendency of deposit formation at elevated temperatures

#### PERFORMANCE STANDARDS

Servocyl M 1000 meets the following specification :

- IS : 1589-1960 with amendment No. 1 of 1966 for Cylinder Oil Grade 2, Type 1 with minor deviation in flash point requirement

### CHARACTERISTICS

ISO VG	680	1000	1500
Kinematic Viscosity, cSt @ 40°C	640-680	980-1050	1450-1550
Viscosity Index, Min.	85	80	80
Flash Point (COC), °C Min.	280	280	280
Pour Point, °C Max.	6	6	6
CCR, % Wt., Max.	3.5	3.5	4.5

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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## SERVO SM

IndianOil

### GRADES AVAILABLE - SERVO SM 85, 175, 260

#### DESCRIPTION

Servo SM oils have been exclusively developed from heavy bodied lube base stocks and contain selected non toxic mild EP additives to meet the requirements of heavily loaded, slow speed, mill-roll bearings in sugar mills.

These oils provide excellent lubrication and prevent wear and corrosion of bearings under all operating conditions. Being viscous, they have excellent resistance to leakage and contain special compounding agents to ensure efficient lubrication of machine elements even in the presence of juice.

#### APPLICATION

Servo SM oils are recommended for the lubrication of sugar mill crusher and mill-roll bearings. These oils are generally applied by means of mechanical force feed lubricators.

In certain industries, these grades are used in centralised lubrication system of slow speed spur and helical gears and for slush pan lubrication of open gears.

#### PERFORMANCE BENEFITS

- Provide excellent protection against rust and corrosion even in presence of fermented sugar cane juice
- Have outstanding lubricating properties thereby permitting increased hydraulic loading of top-roll thus improving extraction efficiency
- Ensure minimum oil consumption
- Withstand severe washing action, due to good adhesive properties
- Provide tenacious film that clings on to the bearing surfaces even under severe operating conditions. This permits the bearing to run at normal established operation temperature.

#### MANUFACTURERS APPROVAL

Servo SM oils are approved by the leading sugar machinery manufactures, such as:

- Backau Wolf New India Engg. Works Ltd., Pune
- K. C. P. Ltd., Madras

#### CHARACTERISTICS

GRADE	85	175	260
Kinematic Viscosity, cSt @ 100°C	38-45	78-88	120-130
Flash Point (COC), °C Min.	230	250	250
Pour Point, °C Max.	6	6	9
Copper strip corrosion, for 3 hrs., @ 100°C	1	1	1

#### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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# SERVO<sup>®</sup> PRODUCT DATA SHEET

## SERVOCOAT

IndianOil

GRADES AVAILABLE – SERVOCOAT 110, 120, 140, 170T, 190

### DESCRIPTION

Servocoat compounds are heavy bodied, adhesive type black lubricants for open gears, wire rope and chain lubrication.

These gear compounds are formulated using highly refined steam cylinder oils having excellent thermal and chemical stability. They contain specially selected bituminous component, which provides excellent adhesiveness. High load carrying characteristics are imparted to the product by a mild EP additive.

### PERFORMANCE BENEFITS

- ☞ Ensure excellent protection of gear teeth under boundary lubrication conditions.
- ☞ Have excellent film adhesiveness thus minimise lubricant throw off.
- ☞ Provide long lasting lubricating film, which takes care of irregular application in small quantity, thus reducing lubrication cost.
- ☞ Protect components against rusting even during idle periods.
- ☞ Have good resistance against water washing.

### APPLICATION

Servocoat compounds are primarily designed for the lubrication of a wide variety of open gears ranging from machine tools/small presses to heavily loaded open gears in cement factories, coal mines, etc. These grades are also suitable for lubrication of kiln tyres, operating at high temperatures, in cement mills and chemical plants. Open gears have been found to be sparsely lubricated at irregular intervals. In such situations a microscopic film of lubricant should be able to withstand the load and prevent metal-to-metal contact. Servocoat compounds form highly tenacious film on metals and thus give excellent performance under severe operating conditions. Servocoat compounds are also suitable for lubrication of wire ropes and chains. This product should not be used in food processing industries.

### MANUFACTURERS APPROVAL

- ☞ ACC – Vickers Babcock Ltd., Shahabad
- ☞ Braithwaite & Co (India) Ltd., Calcutta
- ☞ Backau Wolf New India Engg. Works, Pune
- ☞ EIMCO – KCP Ltd., Madras

### CHARACTERISTICS

GRADE	110	120	140	170T*	190
Kinematic Viscosity, cSt @ 100°C	80-120	220 – 250	400 – 550	710 – 760	900 - 1100
Flash Point (COC), °C Min.	250	250	280	280	280
Copper strip corrosion, 100°C, 3 hrs Max	1	1	1	1	1
Timken OK load, Kg, Min	15	15	15	15	15

\* Also contains special tackiness agent

### HEALTH & SAFETY

These oils are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained.

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